

SURVIVAL OF SALMONELLAE IN SOFT AGAR

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TWO HUNDRED glass ampules, from the Bacterial Archives of the Medical Research Center of the Army, Greece, were sealed by melting and kept closed from 21 to 40 years. The ampules contained pure cultures of salmonellae in soft agar and were examined for surviving bacteria in 1969. The ampules were kept throughout the years in well-closed boxes at room temperature and not opened until this investigation. The cultures for the detection of living salmonellae were made on common nutrients, and the identification of each organism was done serologically.

Results

Details of the results obtained for the individual *Salmonella* organisms and the various periods of sealing of the ampules are given in the table. Of the 200 ampules examined, 151 (75 percent) were found to contain living salmonellae. Surviving *Salmonella typhi* were found in 56 of 80 (70 percent) of the ampules examined, *Salmonella paratyphi* A in 46 of 60 (77 percent), and *Salmonella paratyphi* B in 49 of 60 (82 percent). The rate of survival tended to be higher for the more recently sealed ampules: 49 of 60 ampules (82 percent) sealed from 1941 to 1948 were viable, in contrast to 47 of 60 (78 percent) for 1934-40 and 55 of 80 (69 percent) for 1929-33. These differences, however, were not statistically significant.

Discussion

Salmonellae are known to survive for long periods of time in various natural and artificial mediums (1-5). Previous studies (4) of the

Salmonellae in soft agar surviving in 200 glass ampules sealed by melting and kept closed from 21 to 40 years

<i>Salmonella</i> organism and years of sealing of ampules	Years passed ¹	Number of ampules examined	Number of ampules with living salmonellae	Percent survival
<i>Typhi</i>	21-40	80	56	70
1929-33.....	36-40	40	26	65
1934-40.....	29-35	20	14	70
1941-48.....	21-28	20	16	80
<i>Paratyphi</i> A....	21-40	60	46	77
1929-33.....	36-40	20	14	70
1934-40.....	29-35	20	16	80
1941-48.....	21-28	20	16	80
<i>Paratyphi</i> B....	21-40	60	49	82
1929-33.....	36-40	20	15	75
1934-40.....	29-35	20	17	85
1941-48.....	21-28	20	17	85
Total....	-----	200	151	75

¹ From 1929-48 until examination in 1969.

survival of *Salmonella* were restricted to months rather than years, although a study made in 1929 indicated that these bacteria may survive in nutrient mediums for some years (3). Our results indicated that members of the *Salmonella* group can remain viable for as long as 40 years in such simple mediums as soft agar, although some authors (5) have doubted

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whether they can exist indefinitely in any environment outside the animal body, being primarily intestinal parasites.

Summary

Two hundred glass ampules containing pure cultures of *Salmonella* in soft agar were sealed by melting and stored at intervals from 1929 to 1948. Eighty ampules contained *Salmonella typhi*; 60, *Salmonella paratyphi* A; and 60, *Salmonella paratyphi* B.

The ampules were examined for surviving bacteria in 1969. Interestingly, 151 (75 percent) of them contained viable salmonellae. The percentages of *Salmonella* surviving by culture were as follows: *S. paratyphi* B, 82 percent; *S. paratyphi* A, 77 percent; and *S. typhi*, 70 percent.

The ampules last sealed had the greatest number of viable salmonellae. Eighty-two percent of the cultures in ampules sealed from 1941 to 1948 were viable, as were 78 percent of those sealed

from 1934 to 1948 and 69 percent of those sealed from 1929 to 1933. These differences, however, were not statistically significant.

REFERENCES

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Tearsheet Requests

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Child-Resistant Containers for Pills

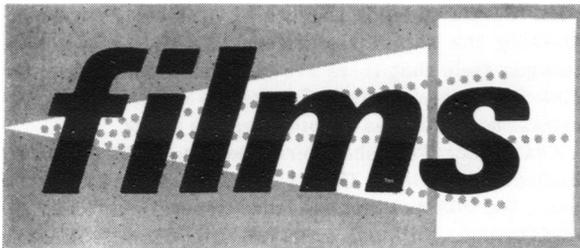
Child-resistant containers (CRC's) should be used for all prescription tablets and capsules dispensed in amounts potentially toxic to children, according to the American Academy of Pediatrics (AAP), Evanston, Ill.

The AAP's Subcommittee on Accidental Poisoning, in a statement which appeared in the AAP Newsletter, June 15, 1970, emphasized that child-resistant containers can reduce ingestion of prescription tablets and capsules by children under 5 years of age by as much as 90 percent.

The statement also pointed out that exceptions may be made for a very small percentage of adult patients who cannot open a CRC because of physical infirmities. In clinical studies, the number of adults unable to open safety closures presently available on the market is less than 1 percent.

Requirements recommended by the committee in selecting child-resistant containers and closures for use were as follows:

- The closure should resist the efforts of children under 5 years of age to open it.
- It should have a relatively simple mechanism which does not require of an adult unusual strength, dexterity, or time to remove or to reapply the closure.
- Neither the closure nor any part of the container should be made to appear as a toy.
- Explicit instructions specifying how to properly remove and replace the safety closure should be supplied in a clear and legible form.
- The closure and container should remain effective for the time required to use the prescription.
- The closure should be effective in preventing contamination of the product in the container.
- The closure and container should not affect the strength or purity of the product in the container.



The Miraculous Pool. Order No. M-1812-X. Motion picture, 16 mm., color, sound, 28 minutes, 1967. Produced by the Institute of Visual Communication, Inc., for Becton-Dickinson, Rutherford, N.J. Cleared for television. Not available for purchase.

AUDIENCE: Health professionals, civic groups, and volunteer health organizations.

SUMMARY: Portrays the story of medical research at the National Institutes of Health, with emphasis on the role of the National Institute of Allergy and Infectious Diseases and its efforts to combat viral and other infectious diseases through a collaborative vaccine development program. Includes scenes in the laboratories of NIAID, the operating room, and wards in the NIH Clinical Center, and research studies at Children's Hospital, Washington, D.C.

Diagnosis and Management of Cystic Fibrosis. Order No. M-1580-X. Motion picture, 16 mm., sound, color, 26 minutes, 1969. Produced by Sturgis-Grant Productions, Inc., under the auspices of the National Institute of Arthritis and Metabolic Diseases and the National Cystic Fibrosis Research Foundation.

AUDIENCE: Physicians, medical students, researchers, nurses, physical therapists, technicians, and other professionals concerned with this disorder. This film is not cleared for television, except educational closed-circuit on which viewing can be restricted to the professional personnel described above. Under no circumstances shall this film be shown to lay audiences—not even to parents of cystic fibrosis patients.

SUMMARY: Explains the nature of cystic fibrosis, its genetic transmission, procedures for diagnosing the disease, rationale and methods of treatment, and prognosis for afflicted children and young adults. Refers to research attempting to establish the etiology of cystic fibrosis and to pinpoint the underlying biochemical defect which results in the secretion of abnormal sweat, saliva, and mucus. Discusses diet, exercise, the role of parents in home care, surgical complications of cystic fibrosis, and childbearing by young women with the disease. Diagrams, charts, and slides showing affected areas are interspersed among live action sequences filmed in the NIH Clinical Center and the Children's Hospital Medical Center in Boston.

AVAILABLE: Free short-term loan to qualified professional groups from the National Medical Audiovisual Center (Annex), Station K, Atlanta, Ga. 30324. Attention: Film Distribution. Not presently available for purchase.

The following four films (made from videotaped lectures) are part of a continuing series on clinical pathology. They were produced by the National Medical Audiovisual Center in cooperation with Dr. Norman Ende, professor of pathology, Emory University School of Medicine, Atlanta, Ga., and are currently being used in the teaching curriculum of the department of pathology at Emory. All are cleared for educational closed-circuit television. A list of related references will be included with each loan.

Basic Epidemiologic and Clinicopathologic Aspects of Malaria. Order No. T-1498. Motion picture, 16 mm. (TFR), black and white, sound, 29 minutes, 1968.

SUMMARY: George U. Fisher, M.D., Parasitic Diseases Branch, Epidemiology Program, Center for Disease Control, discusses the history and geographic distribution of malaria and pathophysiology of the disease, including signs, symptoms, complications, diagnosis, and management. The film shows the mosquito stages of *Plasmodium falciparum* and illustrates in detail, using micrographic slides, the life cycle and morphology of malaria parasites.

AVAILABLE: Free short-term loan from the National Medical Audiovisual Center (Annex), Station K, Atlanta, Ga. 30324. Not presently available for purchase.

Intestinal Parasites. Introduction and techniques of handling specimens. Order No. T-1701. Motion picture, 16 mm. (TFR), black and white, 28½ minutes, 1969.

SUMMARY: Kerrison Juniper, Jr., M.D., professor of medicine, University of Arkansas, reviews the effects of parasites on various organ systems of man and discusses diagnostic techniques. Sixty-seven visuals are used during the lecture.

Intestinal Amebiasis. Order No. T-1702. Motion picture, 16 mm. (TFR), black and white, sound, 23½ minutes, 1969.

SUMMARY: Dr. Juniper discusses symptoms this infection produces, physical findings, and differential diagnosis of *Entamoeba histolytica*. Illustrations include drawings and photographs of the parasite, typical and atypical ulcers, and preparation of wet mounts.

Extraintestinal Amebiasis. Order No. T-1703. Motion picture, 16 mm. (TFR), black and white, sound, 18½ minutes, 1969.

SUMMARY: Dr. Juniper discusses extraintestinal aspects of amebiasis, including hepatic abscess and cutaneous complications, stressing the necessity for early diagnosis through appropriate laboratory procedures. Visuals include photographs and X-rays of affected areas.

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Co-Twin Study: A day in the life of a blind child and her sighted identical twin. Order No. M-1604-X. Motion picture, 16 mm., black and white, sound, 60 minutes, 1968. Produced by the Jewish Guild for the Blind, under a grant from the National Institute of Mental Health, Department of Health, Education, and

Welfare. Cleared for showing on closed-circuit educational television only; clearance for any other showing on ETV must be obtained from Arthur E. Gillman, M.D., 154 East Boston Post Road, Mamaroneck, N.Y. 10543.

AUDIENCE: Institutional and agency personnel concerned with the problems of blindness, mental retardation, and emotional disorders.

SUMMARY: Records a day in the life of identical twins. One twin, totally blind from birth, has had an atypical development with learning and behavioral disturbances—not specific to blindness but complicated by brain damage at birth and mental retardation. The other twin, though visually impaired, functions as a fully sighted, normally developing person without behavioral problems. The film depicts differences in the life and the potential of the girls.

The Forgotten Families. Order No. M-1894-X. Motion picture, 16 mm., color, sound, 28 minutes, 1969. Produced by Community Health Service, Department of Health, Education, and Welfare. Cleared for television.

AUDIENCE: Civic, educational, voluntary and professional health groups, including medical and allied professions.

SUMMARY: Filmed among migrant agricultural workers. The first half portrays a mother seeking care for a sick baby, and shares the problems and confusion she faces. The second half shows ways in which different communities meet the health needs of the migrant workers who serve them.

AVAILABLE: Purchase from Jack L. Copeland Productions, 3518 West Cahuenga Boulevard, Hollywood, Calif. 90023. All other films may be obtained for short-term loan from the National Medical Audiovisual Center (Annex), Station K, Atlanta, Ga. 30324. Unless otherwise indicated, films may be purchased from General Services Administration, National Archives and Records Service, Washington, D.C. 20408. Attention: Film Sales.

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The National Medical Audiovisual Center has sponsored and produced a series of films to provide the medical viewer with the divergent points of view of experts representing their specialty fields. The series, based on contemporary medical thinking, presents questions for which the logic of medical science alone fails to provide clear, unequivocal answers.

AUDIENCE: For professional medical persons. Cleared for television.

The Oral Contraceptives. Order No. T-1780. Motion picture, 16 mm. (TFR), black and white, sound, 29 minutes, 1969.

SUMMARY: Moderator: Sheldon Segal, M.D., director, Population Council, Rockefeller University. Panelists: Celso-Ramon Garcia, M.D., professor of obstetrics and gynecology, Hospital of the University of Pennsylvania, and Louis Lasagna, M.D., associate professor of medicine and of pharmacology and experimental therapeutics, Johns Hopkins University School of Medicine.

Dr. Garcia defends the use of oral contraceptives, stressing the superior efficiency of this method. Dr. Lasagna feels that there are other methods which are clinically more advisable. He stresses the now-emerging adverse consequences of contraceptive drugs.

AVAILABLE: Free short-term loan from the National Medical Audiovisual Center (Annex), Station K, Atlanta, Ga. 30324. Purchase from General Services Administration, National Archives and Records Service, Washington, D.C. 20408. Attention: Government Film Sales.

The Anticoagulation Dilemma. Order No. T-1775. Motion picture, 16 mm. (TFR), black and white, sound, 29 minutes, 1969.

SUMMARY: Moderator: Arthur Selzer, M.D., director, cardiopulmonary laboratory, The Pacific Medical Center, San Francisco. Panelists: Richard V. Ebert, M.D., professor and chairman, department of medicine, University of Minnesota Medical School, and Dean Mason, M.D., chief, cardiopulmonary section, University of California School of Medicine, Davis. Dr. Ebert presents a case in favor of the discriminate use of anticoagulants with myocardial infarction patients. Dr. Mason presents a case against their use.

Diet and Atherosclerotic Disease: Are they related? Order No. T-1880. Motion picture, 16 mm. (TFR), black and white, sound, 29 minutes, 1969.

SUMMARY: Moderator: David Miller, M.D., chief, Atlanta Field Investigations Unit, Heart Disease and Stroke Control Program, Center for Disease Control. Panelists: Jeremiah Stamler, M.D., executive director, Chicago Health Research Foundation, and Mark D. Altschule, M.D., assistant clinical professor of medicine, Harvard University.

Dr. Stamler presents statistical data to implicate diet in the pathogenesis of atherosclerotic disease and argues that alteration of the American dietary pattern is essential if we are to abate our atherosclerotic epidemic. Dr. Altschule points out numerous inadequacies in studies to date. He does not feel that a qualitative change in the American diet would benefit either the coronary patient or the healthy individual.

Involuntary Hospitalization of the Psychiatric Patient: Should it be abolished? Order No. T-1748. Motion picture, 16 mm. (TFR), black and white, sound, 29 minutes, 1969.

SUMMARY: Moderator: Harold Visotsky, M.D., chairman, department of psychiatry, Northwestern University Medical School. Panelists: Jules H. Masserman, M.D., professor of neurology and psychiatry, co-chairman of psychiatry, Northwestern University Medical School, and Thomas S. Szasz, M.D., professor of psychiatry, State University of New York, Upstate Medical College.

Dr. Masserman contends that there are certain clinical situations in which a person must be hospitalized for psychiatric reasons against his will, whereas Dr. Szasz contends that psychiatry must be practiced on a purely contractual basis with the patient.

SHAPIRO, JEROME (District of Columbia Health Services Administration), and **RHEE, CHU S.:** *Podiatry screening project for children in the District of Columbia. Public Health Reports, Vol. 85, September 1970, pp. 803-808.*

In 1967, the District of Columbia Department of Public Health (now the District of Columbia Health Services Administration), in cooperation with the District of Columbia Board of Education and podiatrists from the metropolitan area, instituted a pilot foot screening project at two elementary schools, which reached 1,062 children. This screening revealed a great enough proportion of children with previously undetected foot disorders (20 percent) to warrant continuation and expansion of the program. The screening was therefore extended in 1968 to the entire school population

of nine elementary schools. Since many foot conditions, when discovered in older children, are not readily amenable to treatment, the screening during 1969 was limited to the preschool and kindergarten children of 41 elementary schools. Although the criteria for evaluation remained the same during the pilot and the general screening, a simplified and improved method of screening was used in 1969.

During the years 1968-69, a total of 8,995 children were screened. More than half were under age 6, almost all were nonwhite, and the sexes were nearly equal in number. Post-

ural and orthopedic disorders were the abnormalities most frequently encountered; almost 37 percent of the children had such a disorder, and it most frequently was flat feet. Sixteen percent of the children had some skin abnormality (corns, calluses, warts, athlete's foot, and so forth). Gait deviations were noted in 15 percent, nail abnormalities in 4 percent.

Of the 8,995 pupils screened, 997 were referred for treatment and 838 for further study. Four hundred nine of the children referred for treatment or study had come to the podiatry clinics of the health department for examination by July 15, 1970. Because of the results of the screening and the response to referral recommendations, the screening program will continue.

GREEN, LAWRENCE W. (Johns Hopkins University): *Manual for scoring socioeconomic status for research on health behavior. Public Health Reports, Vol. 85, September 1970, pp. 815-827.*

The socioeconomic status (SES) indices suggested in this manual were developed from stepwise regression analyses on data from a statewide sample (N=1,592) of California families with at least one child under 5 years of age. The dependent variable was a composite index of nine types of preventive health behavior. The independent variables were education, income, and occupation. The methods can be applied either to households or to census tracts and larger units of observation.

The SES indices are intended to optimize the prediction of family health actions from socioeconomic information. They are not intended to apply to institutionalized, adolescent, or aged populations, and they should be validated further in populations most unlike California's.

Variations in normal preventive health behavior usually are more highly correlated with income, education, and occupation than with other attributes. Formulation of SES in terms of social norms of preventive

health behavior makes the index functional for public health, both as a predictive instrument and as an analytic tool in sampling, selection of target groups, and in statistical control.

Standardized scores are used to code education, gross family income, and occupation of the main earner on comparable scales. Education of the female head of household is recommended because the educational level of the woman of the house has been found to be more highly correlated with family health behavior than the education of the male head of the household.

Use of region-specific income scores is recommended for all but nationwide samples. Nationally standardized scores for occupations are given in a list based on a classification scheme of the U.S. Bureau of the Census. Statistical methods used to develop the SES weighting system were similar to those used by Hollingshead but with a much larger and more representative sample and with

more comprehensive and contemporary measures of income, education, and occupation.

The optimum prediction of preventive health behavior can be obtained by combining the education, income, and occupational scores weighted differently for white and nonwhite persons, groups, or residents of census tracts.

Regression weights are essentially the same for either income or occupation when combined singly with education of the female head of household. The education and income two-factor index is highly correlated with preventive health behavior. Occupation, however, is more closely related than income to preventive dental care and well-baby visits. Income is more highly correlated with prenatal care and poliomyelitis immunizations.

The main use of SES scores will be to partition variance in health behavior explained by socioeconomic factors so that other contributing variables, such as knowledge and attitudes, can be analyzed independently. The best SES index, therefore, will be a composite of those variables most highly correlated with the behavior being investigated.

DODGE, WARREN F. (University of Texas Medical Branch, Galveston), and **WEST, EVELYN F.:** *Consumers' motivation and acceptance of urinary screening of school children. Epidemiologic study. Public Health Reports, Vol. 85, September 1970, pp. 828-834.*

A prospective epidemiologic study of hypertension and chronic renal disease provided a unique opportunity to investigate factors affecting consumer acceptance and participation. The study population was composed of all children enrolled in the appropriate three grades of public, private, and parochial schools in Galveston County, Tex. Annual participation of each of the 10,000 eligible school children was predicated upon receipt of parental permission for the tests. Demographic data, past medical history, and consumer opinions were obtained by structured in-

terview with the parents of about one-fourth of the eligible children. Outcome of referrals for medical care of children found to have abnormal test results was obtained from their personal physicians.

Our observations indicate that only about one-fifth of school-age children in this locale received an annual checkup. Thus, either their parents need to be educated as to the importance of seeking periodic health care or else a system which would assure more complete delivery appears necessary. Our experience suggests that incorporation of ap-

propriate preventive care services into school health programs provides a delivery system which is immediately applicable to children of school age and, of equal importance, is acceptable to and will be used by the majority of parents.

In contrast, our experience also indicates that a sizable portion of referred children will not receive subsequent medical attention and that this observation is not explained by differences in availability of medical care. On the other hand, provision of screening tests through school health programs will permit maximum utilization of the therapeutic knowledge and skills of the community's physicians since, for the majority of children, the test results can be expected to be normal.

DENISTON, O. LYNN (University of Michigan), and **ROSENSTOCK, IRWIN M.:** *Evaluating health programs. Public Health Reports, Vol. 85, September 1970, pp. 835-840.*

A program is an organized response to eliminate or reduce one or more problems where the response includes one or more objectives, performance of one or more activities, and expenditure of resources.

Five foci have been identified for evaluation of the program. For appropriateness, were the proper values used to select the problem? For effectiveness, to what extent were objectives attained? For adequacy, how much of the total problem was eliminated? For efficiency, at what costs

were the objectives attained? And for side effects, what outcomes occurred that were not central to the objectives of the program?

Programs are always evaluated but the evaluations vary as to whether the measures are presumptive or direct and the degree to which the measures are impressionistic or objective. Valid and objective measures of program goals make it possible to assess a program systematically. Ideally, we should compare the actual status at the time of evalua-

tion with the status that would have existed had there been no program.

In the process of setting objectives, one should not only specify the desired amount of change but also the absolute level expected. If both estimates are specified when the program is being planned, subsequent evaluation can reveal both the extent to which an intended amount of change has occurred and also the accuracy of the planning estimates. When the findings are fed back into the planning process they should have the effect of increasing both the effectiveness of the program and the accuracy of planning.

KOKOLIOS, H. (Medical Research Center of the Army, Athens, Greece), **PAIZIS, Ch., BREDAKIS, F., and GEORGOPOULOS, A. P.** *Survival of salmonellae in soft agar. Public Health Reports, Vol. 85, September 1970, pp. 841-842.*

Two hundred glass ampules containing pure cultures of *Salmonella* in soft agar were sealed by melting and stored at intervals from 1929 to 1948. Eighty ampules contained *Salmonella typhi*; 60, *Salmonella paratyphi A*; and 60, *Salmonella*

paratyphi B.

The ampules were examined for surviving bacteria in 1969. Interestingly, 151 (75 percent) of them contained viable salmonellae. The percentages of *Salmonella* surviving by culture were as follows: *S. para-*

typhi B, 82 percent; *S. paratyphi A*, 77 percent; and *S. typhi*, 70 percent.

The ampules last sealed had the greatest number of viable salmonellae. Eighty-two percent of the cultures in ampules sealed from 1941 to 1948 were viable, as were 78 percent of those sealed from 1934 to 1948 and 69 percent of those sealed from 1929 to 1933. These differences, however, were not statistically significant.